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EXAMINER	
GARCIA, LUIS	
ART UNIT	**PAPER NUMBER**
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

SF

Office Action Summary	Application No. 10/648,428	Applicant(s) YASUE ET AL.
	Examiner Luis F. Garcia	Art Unit 2613

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *August 27, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7,10 and 12-14* is/are rejected.

7)☒ Claim(s) *4-6,8,9 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claim 1, 3, 7 and 10 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (US 5,351,148) in view of Wu et al (Us 6,134,273), Maeda et al hereinafter referred to as Maeda and Wu et al hereinafter referred to as Wu.

Regarding claim 1, Maeda discloses an optical transmitting device for transmitting an optical signal via an optical transmission path to a receiving device connected via prescribed communication lines to first to n'th terminal devices (where n is an integer of 2 or more) **(FIG. 4)**,

the optical transmitting device comprising:

a modulating section for generating first to n'th modulated signals based on first to n'th data signals to be transmitted to the first to n'th terminal devices **(FIG. 4**

(123-modulator) in which the modulators (modulating section) generate first to n'th modulated signal based on the digital signal source (first to n'th data signals)), respectively, the first to n'th modulated signals being obtained by modulation with individual modulation parameters **(FIG. 4 (123-modulator) and col3 ln36-49 in which the modulated signals are obtained based on calculated modulation parameters (e.g. modulation index, error rate, etc))**;

an optical transmitting section for converting the first to n'th modulated signals generated by the modulating section into an optical signal **(FIG. 4 (14-optical-electric converter) in which the E/O converter converts the first to n'th modulated signals into an optical signal)** and for transmitting the optical signal to the receiving device via the optical transmission path **(FIG. 4 (14-optical-electric converter) in which the optical signal is transmitted to the receiving device via fiber-3 (optical transmission path))**;

Maeda does not expressly disclose a data amount estimating section for estimating an amount of data for each of the first to n'th data signals; and

a parameter control section for setting the individual modulation parameters used in the modulating section based on amounts of data for the first to n'th data signals estimated by the data amount estimating section.

Wu teaches a data amount estimating section for estimating an amount of data for each of the first to n'th data signals **(col1 ln55-58 in which the number of bits on each channel are estimated, e.g. amount of data is estimated)**; and

a parameter control section for setting the individual modulation parameters used in the modulating section based on amounts of data for the first to n'th data signals estimated by the data amount estimating section **(FIG. 3 (g(i)-bit estimation) and col1 ln55-58/col2 ln25-47 in which the modulation parameters (e.g. constellation size, correction gain factor-g_n, bit rate, etc) are set based on the estimated data bits and FIG. 3 (g(i)-bit estimation) col3 ln36-52 in which the transmitted data rate/constellation size is varied based on estimated data bits, e.g. FIG. 3-flow chart for the procedure of bit estimation and assignment)**.

It would have been obvious to one of ordinary skill in the art to modify Maeda and incorporate Wu's teachings of setting modulation parameters based on the estimated data. The motivation being that Wu's teachings allows the system to adapt to channel conditions and channel capacity (col3 ln39-52) and keeps the output power at the transmitter constant regardless of constellation size (col2 ln30-34); thereby, allowing the system to dynamically adjust modulation parameters based on bit estimation (FIG. 3).

Regarding claim 3, Maeda in view of Wu discloses the optical transmitting device according to claim 1 as applied above.

Maeda does not expressly disclose wherein the data amount estimating section estimates the amount of data for each of the first to n'th data signals based on the data signal itself.

Wu discloses wherein the data amount estimating section estimates the amount of data for each of the first to n'th data signals based on the data signal itself **(col1 ln55-**

58 in which the number of bits (data amount) is estimated for each tone (data signal) itself).

It would have been obvious to one of ordinary skill in the art to modify Maeda and incorporate Wu's teachings of setting modulation parameters based on the estimated data. The motivation being that Wu's teachings allows the system to adapt to channel conditions and channel capacity (col3 ln39-52) and keeps the output power at the transmitter constant regardless of constellation size (col2 ln30-34); thereby, allowing the system to dynamically adjust modulation parameters based on bit estimation (FIG. 3).

Regarding claim 7, Maeda in view of Wu disclose the optical transmitting device according to claim 1 as applied above.

Wu further discloses wherein the parameter control section sets the individual modulation parameters so as to have values within a range such that the first to n'th modulated signals satisfy a condition concerning a transmission quality in the optical transmission path **(FIG. 4 (123-modulators) and col8 ln38-47 in which the light modulation indexes (modulation parameters) of the modulators (123) are set within a range (e.g. range that marks the onset of diverging from the error rate- FIG. 5) corresponding to the error rate of the transmission path (transmission quality condition))**.

Regarding claim 10, Maeda in view of Wu disclose the optical transmitting device according to claim 1 as applied above.

Maeda discloses wherein the individual modulation parameters include performing quadrature amplitude modulation on each of the first to n'th data signals

(FIG. 4 (12-QAM signal sources) in which the modulation parameters of the QAM signal sources convert first to n'th data signals (e.g. digital signal sources-121) in to QAM signals), and signal levels of modulated signals obtained by the quadrature amplitude modulation **(FIG. 4 (12-QAM signal sources) in which QAM produces signal levels of modulated signals, e.g. FIG. 5: 16 QAM produces modulated signals at one of sixteen different symbol levels)**.

Maeda does not expressly disclose wherein the individual modulation parameters include constellation levels used for performing quadrature amplitude modulation.

Wu teaches wherein the individual modulation parameters include constellation levels used for performing quadrature amplitude modulation **(col1 ln55-58 in which)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Maeda and incorporate Wu's teachings of varying the constellation level/size (e.g modulation parameters) of a QAM transmitter. The motivation being that Wu's teachings allows the system to adapt to channel conditions and channel capacity (col3 ln39-52) and keeps the output power at the transmitter constant regardless of constellation size (col2 ln30-34); thereby, allowing the system to dynamically adjust modulation parameters based on bit estimation (FIG. 3).

Claim 2, 12-13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of Wu in further view of Wei (US 5,243,629).

Regarding claim 2, Maeda in view of Wu disclose the optical transmitting device according to claim 1 as applied above.

Maeda in view of Wu does not expressly disclose wherein the modulating section includes a frequency converting section for performing frequency conversion on the first to n'th modulated signals so as to have respective different frequencies.

Wei teaches wherein the modulating section includes a frequency converting section for performing frequency conversion on the first to n'th modulated signals so as to have respective different frequencies **(FIG. 1 (100-transmitter, 161-172-baseband modulator) in which the baseband modulators within the transmitter-100 perform frequency conversion in order for the modulated signal to have respective different frequencies)**.

It would have been obvious to one of ordinary skill in the art to modify Maeda in view of Wu and incorporate Wei's teachings of frequency converting the modulated signals onto different carriers. The motivation being that this allows the system to group QAM modulated signals into classes based on different frequencies. Thereby, giving the system the flexibility to transmit "more important" information on channels with less noise and also provide the "more important" channels with greater error protection (Wei col2 ln35-42).

Regarding claim 12, Maeda discloses an optical transmission system comprising:

a transmitting device for transmitting a signal via an optical transmission path **(FIG. 4 (1-transmitting station))**;

a receiving device for receiving the signal transmitted via the optical transmission path **(FIG. 4 (2-receiving station))**; and

wherein the transmitting device comprises:

a modulating section for generating first to n'th modulated signals based on first to n'th data signals to be transmitted to the first to n'th terminal devices **(FIG. 4 (1-transmitting station) in which the transmitting station includes a modulators (123) for modulating the first to n'th signals based on respective digital data (121))**, respectively, the first to n'th modulated signals being obtained by modulation with individual modulation parameters **(FIG. 4 (123) in which the first to n'th modulated signals are obtained by modulation with individual modulation parameters (e.g. parameters: modulation index, carrier frequency, etc))**;

an optical transmitting section for converting the first to n'th modulated signals generated by the modulating section into an optical signal and for transmitting the optical signal to the receiving device via the optical transmission path **(FIG. 4 (1-transmitting station, 14-E/O converter, 2-receiving station) in which the transmitting station converts the first to n'th modulated signals into an optical signal, via E/O converter, for transmission to the receiving station)**; an optical receiving section for receiving an optical signal transmitted via the optical transmission path and for converting the optical signal into an electric signal **(FIG. 4 (2-receiving station) in which the receiving station converts the optical received signal into an electrical signal)**; and an electric transmitting section for transmitting the <u>modulated signal</u> contained in the electric signal, which is obtained by conversion via the optical receiving section, to the <u>terminal</u> to which the <u>modulated signal</u> should be transmitted via the prescribed communication line **(FIG. 4 (21-photo-receiver) in which the**

electrical signal from the photo-receiver is transmitted, via prescribed electrical communication line, to the error corrector-24).

wherein the receiving device includes: an optical receiving section for receiving an optical signal transmitted via the optical transmission path and for converting the optical signal into an electric signal **(FIG. 4 (2-receiving station, 3-fiber) in which the receiving station (receiving device) includes a photo receiver (21) for receiving the transmitted optical signal)**;

Maeda does not expressly disclose first to n'th (where n is an integer of 2 or more) terminal devices connected via respective prescribed communication lines to the receiving; a data amount estimating section for estimating an amount of data for each of the first to n'th data signals; and a parameter control section for setting the individual modulation parameters used in the modulating section based on amounts of data for the first to n'th data signals estimated by the data amount estimating section; and wherein the receiving device includes: first to n'th (where n is an integer of 2 or more) terminal devices connected via respective prescribed communication lines to the receiving device; and an electric transmitting section for transmitting the <u>first to n'th modulated signals</u> contained in the electric signal, which is obtained by conversion via the optical receiving section, to the <u>first to n'th terminals</u> to which the <u>first to n'th modulated signals</u> should be transmitted via the prescribed communication <u>lines</u>.

Wu teaches a data amount estimating section for estimating an amount of data for each of the first to n'th data signals **(col1 ln55-58 in which the number of bits on each channel are estimated, e.g. amount of data is estimated)**; and a parameter

control section for setting the individual modulation parameters used in the modulating section based on amounts of data for the first to n'th data signals estimated by the data amount estimating section **(col1 ln55-58 and col2 ln25-47 in which the modulation parameters (e.g. constellation size, correction gain factor-g_n, etc) are set based on the data estimation)**.

It would have been obvious to one of ordinary skill in the art to modify Maeda and incorporate Wu's teachings of setting modulation parameters based on the estimated data. The motivation being that Wu's teachings allows the system to adapt to channel conditions and channel capacity (col3 ln39-52) and keeps the output power at the transmitter constant regardless of constellation size (col2 ln30-34); thereby, allowing the system to dynamically adjust modulation parameters based on bit estimation (FIG. 3).

Maeda in view of Wu does not expressly disclose wherein the receiving device includes: first to n'th (where n is an integer of 2 or more) terminal devices connected via respective prescribed communication lines to the receiving device; and an electric transmitting section for transmitting the first to n'th modulated signals contained in the electric signal, to the first to n'th terminals to which the first to n'th modulated signals should be transmitted via the prescribed communication lines; and wherein each of first to n'th terminal devices includes a demodulating section for demodulating a modulated signal transmitted via a corresponding one of the prescribed communication lines.

Wei teaches wherein the receiving device includes: first to n'th (where n is an integer of 2 or more) terminal devices connected via respective prescribed communication lines to the receiving device **(FIG. 2 (300-receiver) in which the**

receiver includes: first to n'th terminal devices (e.g. 1 to 12 terminal devices)); and an electric transmitting section for transmitting the first to n'th modulated signals contained in the electric signal, to the first to n'th terminals to which the first to n'th modulated signals should be transmitted via the prescribed communication lines **(FIG. 2 (300-receiver) in which the electric transmitting section (e.g 395-demodulator) transmits the first to n'th received modulated signal (e.g 1 to 12 received electrical signals) to the terminal devices via prescribed transmission lines (e.g. via respective transmission line-50))**; and

wherein each of first to n'th terminal devices includes a demodulating section for demodulating a modulated signal transmitted via a corresponding one of the prescribed communication lines **(FIG. 2 (361-372-demodulator) in which each terminal device (1 to 12) includes a respective demodulator for demodulating the modulated received signal)**.

It would have been obvious to one of ordinary skill in the art to modify Maeda in view of Wu and incorporate Wei's teachings of have a receiving module with first to n'th terminal devices. The motivation being that this allows the system to received and separate and distribute multiplexed QAM channels; thereby, allowing the system to distribute information channels to the appropriate terminals.

Regarding claim 13, Maeda in view of Wu in further view of Wei disclose the optical transmission system according to claim 12 as applied above.

Maeda further discloses comprising a first transmission path connected between the receiving device and the transmitting device **(FIG. 4 (3-fiber))**, wherein the receiving

device further includes: a distortion monitoring section for detecting a distortion level at a prescribed frequency in an electric signal obtained by optical-to-electrical conversion via the optical receiving section **(col8 ln38-47 in which the distortion level (e.g. thermal noise power and the received power) are monitored at the receiver for a respective channel)**; and

a distortion information transmitting section for transmitting distortion level information about a distortion level detected by the distortion monitoring section to the transmitting device via the first transmission path, and wherein the parameter control section sets the individual modulation parameters such that the distortion level indicated by the distortion level information transmitted via the first transmission path becomes lower than or equal to a prescribed distortion level value **(FIG. 4 (12-QAM signal sources, 123-modulator) and col8 ln38-47 in which the distortion information (thermal noise power and receiver power) is used to set the modulation index (modulation parameter) at the transmitter station; therefore, a the distortion information is inherently fed back to the transmitter via a transmission path in order to be able to set the modulation parameters of the respective transmitter. Furthermore, the modulation index is set to be within a prescribed distortion level value, e.g. FIG. 5- set to be greater then 1)**.

Regarding claim 14, rejected as stated in claim 13 rejection in which the thermal noise power and the receiver power is functionally equivalent to quality information.

Allowable Subject Matter

4. Claims 5-6, 8-9 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Van Nee (US 6,175,550)-Van Nee discloses an OFDM system that dynamically adjust the modulation parameters (e.g. symbol durations, number bits per symbol per carrier, FEC coding scheme, coding rate, etc...) in order to scale operating parameters (e.g. SNR, signal bandwidth, etc...). Furthermore, the modulation parameters are affected by feedback from the receiver to dynamically scale the operating parameters.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER